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1 1. A method of forming a trench isolation
2 comprising:
3 forming a region containing oxidation enhancing
4 impurities in a semiconductor structure; and
5 making a trench through said region, leaving a
6 portion of said region around said trench.

1 2. The method of claim 1 wherein forming said region
2 includes forming said region using ion implantation.

1 3. The method of claim 2 wherein using ion
2 implantation includes using implantation at energies below
3 20 keV.

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1 4. The method of claim 1 wherein forming said
2 regions includes implanting impurities which enhance the
3 oxidation of said structure beyond that which would be
4 expected from crystallographic damage effects.

1 5. The method of claim 4 further including
2 implanting argon.

1 6. The method of claim 4 further including
2 implanting oxygen.

1 7. The method of claim 3 wherein using implantation
2 further includes using an angled ion implant.

1 8. The method of claim 1 wherein making a trench
2 includes forming a trench by an anisotropic etch to create
3 substantially vertical sidewalls.

1 9. The method of claim 1 wherein forming a region
2 includes causing diffusion to occur from a solid diffusion
3 source.

1 10. The method of claim 1 including forming said
2 region before making a trench.

1 11. The method of claim 1 including using the same
2 mask to form the region and the trench.

1 (12) A method of forming a trench isolation
2 comprising:
3 forming a trench in a semiconductor structure;
4 and
5 implanting an oxidation enhancing species in a
6 region proximate to the trench using an implant energy of
7 less than about 20 keV.

1 13. The method of claim 12 wherein implanting
2 includes implanting at an energy of less than 10 keV.

1 14. The method of claim 12 including implanting inert
2 species.

1 15. The method of claim 14 including implanting
2 argon.

1 16. The method of claim 12 including implanting
2 oxygen.

1 17. The method of claim 12 wherein implanting
2 includes implanting said species at an angle.

1 18. The method of claim 12 including implanting
2 before forming a trench.

1 19. The method of claim 12 including using the same
2 mask for implanting and forming a trench.

1 (20.) A method of forming a trench isolation
2 comprising:
3 depositing a solid source diffusion layer on a
4 semiconductor structure;

5 causing impurities from said diffusion layer to
6 diffuse from said layer into said structure; and
7 forming a trench through said impurities in said
8 structure.

1 21. The method of claim 20 wherein depositing a solid
2 source diffusion layer includes depositing a doped glass
3 layer.

1 22. The method of claim 20 wherein depositing a solid
2 source diffusion layer includes depositing a layer doped
3 with argon.

1 23. The method of claim 20 further including forming
2 a masking layer, defining an opening in said masking layer,
3 and depositing said diffusion layer into said opening.

1 24. The method of claim 23 including using said
2 masking layer to form said trench.

1 25. The method of claim 23 wherein forming said
2 masking layer includes forming a pad oxide covered by a
3 nitride layer.

1 26. A method of forming a trench isolation
2 comprising:

3 forming a trench into a semiconductor material
4 and defining an edge at the surface of said semiconductor
5 material; and
6 forming a region, proximate said edge, formed
7 primarily of laterally scattered impurities.

1 27. The method of claim 26 wherein forming a region
2 includes using ion implantation to form an implanted region
3 with lateral scattering and thereafter forming said trench
4 by etching through said implanted region.

1 28. The method of claim 26 wherein forming an region
2 includes implanting argon.

1 29. The method of claim 28 wherein forming a region
2 includes defining an opening in a masking layer including a
3 nitride layer over an oxide layer.

1 30. The method of claim 26 wherein forming a region
2 includes ion implanting oxidation enhancing impurities at
3 energies of less than about 20 keV.

1 31. The method of claim 26 further including forming
2 a thermal sidewall oxidation layer on said trench.

1 32. The method of claim 26 wherein forming a region
2 includes ion implanting an inert species.

1 33. A method of forming a trench isolation
2 comprising:
3 defining an opening in a masking layer over a
4 semiconductor structure;
5 causing impurities to enter a portion of said
6 structure through said opening; and
7 using said mask to form a trench through the
8 portion of said structure containing said impurities.

1 34. The method of claim 33 wherein defining an
2 opening includes forming a pad oxide covered by a nitride
3 layer.

1 35. The method of claim 33 wherein causing impurities
2 to enter said semiconductor structure includes ion
3 implanting said impurities.

1 36. The method of claim 35 including implanting inert
2 impurities.

1 37. The method of claim 36 including implanting
2 argon.

1 38. The method of claim 35 including implanting
2 oxygen.

1 39. The method of claim 35 including ion implanting
2 at energies of less than 20 keV.

1 40. The method of claim 33 wherein causing impurities
2 to enter a portion of said semiconductor structure includes
3 depositing a solid diffusion source over said masking layer
4 and diffusing impurities from said source into said
5 structure through said opening.

1 41. The method of claim 33 including causing
2 impurities to enter said structure, which impurities
3 enhance oxidation separate and apart from any
4 crystallographic damage effects.

1 (42.) A semiconductor integrated circuit device formed
2 by a process comprising:
3 forming a region containing oxidation enhancing
4 impurities in a semiconductor structure; and
5 making a trench through said region, leaving
6 portions of said region on both sides of said trench.

1 43. The device of claim 42 formed by a process
2 further comprising ion implanting said oxidation enhancing
3 impurities.

1 44. The device of claim 42 formed by a process
2 further comprising ion implanting argon to form said
3 region.

1 45. The device of claim 42 formed by a process
2 further comprising forming a region containing oxidation
3 enhancing impurities by diffusing those impurities from a
4 solid diffusion source.